

REMARKS

Reconsideration of the application is respectfully requested. Claim 25 was rejected under Section 101 as being
5 directed to a non-statutory subject matter. Claim 25 has now been amended to involve a computer and should conform to Section 101. No new matter has been added.

Claims 1-15 and 24-25 were rejected as being anticipated by Hyypa. This rejection is respectfully
10 traversed.

Claim 1 has been amended to clarify that the method involves both producing overlapping images by aerial or terrestrial photography and producing a point cloud by using a laser scanner. Claim 1 has also been amended to clarify
15 that the point cloud is densified by using three-dimensional information from the overlapping images. No new matter has been added.

An important feature of the present invention is that the method comprises both laser scanning and overlapping
20 aerial/terrestrial photography. The results of these two types of measurements are combined in order to get more accurate results. In other words, the method of the present invention makes use of both laser scanning measurements and overlapping (high resolution) images from photography. The
25 needed amount of pulses produced by laser scanning is much smaller when the point clouds are densified with point clouds from overlapping images from photography. This is described on page 4, lines 29 - 32 of the patent specification. The present invention avoids the need for having to use a dense
30 number of laser pulses. This makes the method of the present invention cost effective since laser scanning is expensive (see specification page 6, lines 15 - 22 and lines 24 - 30). The present invention takes advantage of laser scanning by producing only a modest pulse density in evaluation of stands

together with overlapping image information for higher point density. Earlier attempts have failed in producing accurate results with a modest number of laser pulses (see page 6, line 31 - page 7, line 3). In the method of the present invention, a (sparse) point cloud is produced by laser measurements. Each point represents a sample hit (a position, where the laser beam has hit with a tree). If the number of sample hits is high enough, individual trees and groups of trees can be identified. This means that three-dimensional information can be achieved in order to determine positions of trees.

One main idea of the present invention is to densify (improve) the point cloud derived with the laser scanning with a point cloud obtained from overlapping photographic images. This is performed in such a way that the point cloud produced by laser scanning and the overlapping images, from which a point cloud giving three-dimensional information is calculated using a photogrammetric process, are brought into the same coordinates system so that the information from different sources can be combined (see specification page 5, lines 4 - 6 and page 10, lines 4 - 6 and pages 12-13). Terrestrial photography gives three-dimensional information when overlapping images are processed in a similar way. Both the laser scanning and the aerial/terrestrial photography may be performed from a flying or terrestrial platform (see specification page 8, lines 20 - 21).

Hyyppa merely relates to a method of determining the growth of trees based on first and second laser measurement data obtained at different moments in time. It is important to understand that only laser measurements are used in this reference. Applicants are very familiar with the teaching of Hyyppa since Hyyppa is a co-inventor of the current application also.

It is submitted that the cited reference fails, among other things, to teach the step of producing overlapping images by aerial or terrestrial photography. The examiner refers to paragraph [0025] of Hyypa. It should be noted that this paragraph only mentions laser measurements. The word "measurements" in paragraphs [0022-0024] refers to the laser scanning. As explained above, the present invention uses data from both overlapping photographic images and laser measurements. It should be understood that laser scanning may provide three-dimensional data. Overlapping photographic images may also provide three-dimensional data (by using, for example, a photogrammetric process). Both results from laser scanning and photographic images may be obtained by using e.g. aircraft.

On page 3 of the Office action, the Examiner refers to paragraph 0036 of Hyypa. It is respectfully submitted that Hyypa completely fails to teach or suggest the step of "densifying the point cloud with three-dimensional information from the overlapping images" produced by aerial or terrestrial photography. In contrast, Hyypa merely discusses comparing point clouds of first and second laser measurement data both of which are obtained by laser scanning. Laser scanning is submitted to be substantially different from aerial or terrestrial photography. Oxford English Dictionary (10th edition) defines "photograph" as "a picture made with a camera, in which an image is focused on to film and then made visible and permanent by chemical treatment." The word "laser" is defined as "a device that generates an intense narrow beam of coherent monochromatic light by stimulating the emission of photons from excited atoms or molecules. Laser scanning is thus quite different from photography. Laser scanning does not involve the use of a camera and chemical treatment in the manner defined. In other words, in the present invention, the results of two

different kinds of measurements are combined (laser scanning and aerial/terrestrial photography). This often means the results from the laser scanning must first be converted by means of a photogrammetric process to point clouds to get more accurate results.

In contrast, Hyyppa merely compares two laser measurements in order to figure out how much the trees have grown. They do that by comparing the z-coordinates from the two laser results taken at different times. In the present invention, simultaneously taken photographic and laser scanning images are preferably used to create a more dense point cloud at a given point in time.

Applicants cannot see why a person of ordinary skill in the art would look to Hyyppa to, for example, learn about densifying the point cloud produced by a laser scanner with three-dimensional information from the overlapping photographic images to produce a denser point cloud when such steps are completely missing. There is nothing in Hyyppa about densifying the point cloud in the manner of the present invention.

Hyyppa requires extensive modifications that are not taught or suggested in order to meet the limitations of the amended claim 1. In view thereof, claim 1 is submitted to be allowable.

Claims 2-15 and 24 are submitted to be allowable because they depend upon the allowable base claim 1 and because each claim includes limitations that are not taught or suggested in the cited references.

The amended claim 25 is submitted to be allowable for reasons similar to the reasons put forth for the allowability of the amended claim 1.

Claims 16-23 were rejected as being obvious over Hyyppa in view of Rouseelle. This rejection is respectfully traversed.

Claims 16-23 are submitted to be allowable because they depend upon the allowable base claim 1 and because each claim includes limitations that are not taught or suggested in the cited references.

5 The application is submitted to be in condition for allowance, and such action is respectfully requested.

Respectfully submitted,

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